

Inositol

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CambridgeSoft

Monograph Number: 5001

Title: Inositol

CAS Registry Number: 87-89-8

CAS Name: *myo*-Inositol

Additional Names: *meso*-Inositol; *l*-Inositol; hexahydroxycyclohexane; cyclohexanehexol; cyclohexitol; meat sugar; inosite; mesoinosite; phasemannite; dambose; nucite; bios I; rat antispectacle eye factor; mouse antiallopecia factor

Molecular Formula: $C_6H_{12}O_6$

Molecular Weight: 180.16

Percent Composition: C 40.00%, H 6.71%, O 53.28%

Literature References: Widely distributed in plants and animals. Growth factor for animals and microorganisms. Isolated from heart muscle; Scherer, *Ann.* **73**, 322 (1850); from liver: Woolley, *J. Biol. Chem.* **139**, 29 (1941). Synthesis: Wieland, Wishart, *Ber.* **47**, 2082 (1914); Anderson, Wallis, *J. Am. Chem. Soc.* **70**, 2931 (1948). Obtained commercially from corn steep liquor, since inositol is present as phytic acid in corn: Bartow, Walker, *Ind. Eng. Chem.* **30**, 300 (1938); US **2112553** (1938); Hoglan, Bartow, *J. Am. Chem. Soc.* **62**, 2397 (1940); Elkin, Meadows, US **2414365** (1947); GB **601273** (1948 to Corn Prod. Refining). Nine possible stereoisomers: Seven are optically inactive or *meso*. Two optically active forms, the racemic form, and several *cis,trans*-isomers occur naturally. The prevalent natural form is *cis*-1,2,3,5-*trans*-4,6-cyclohexanehexol which is described here. *Reviews:* R. Beckmann, *m-Inositol* (Editio Cantor, Aulendorf, 1953); several authors in *The Vitamins*, vol. 2, W. H. Sebrell, Jr., R. S. Harris, Eds. (Academic Press, New York, 1954) pp 321-386; *Ibid.* vol. 3 (2nd ed., 1971) pp 340-415.

Properties: Anhydrous, non-hygroscopic crystals from water or acetic acid above 80°. Sweet taste. d_{1752} mp 225-227°. Optically inactive. Soluble in water at 25° 14 g/100 ml soln; at 60° 28 g/100 ml soln. Slightly sol in alc. Practically insol in ether and other common organic solvents. Aq solns are neutral to litmus.

Melting point: mp 225-227°

Density: d_{1752}

Derivative Type: Dihydrate

Properties: Efflorescent crystals from water below 50° d_{1524} mp 218° Becomes anhydrous at 100°

Melting point: mp 218°

Density: d_{1524}

Derivative Type: Monophosphate

CAS Registry Number: 573-35-3

Molecular Formula: $C_6H_{13}O_7P$

Molecular Weight: 260.14

Percent Composition: C 27.70%, H 5.04%, O 55.35%, P 11.91%

Literature References: Prepn: Posternak, Posternak, *Helv. Chim. Acta* **12**, 1165 (1929); McCormick, Carter, *Biochem. Prepn.* **2**, 65 (1952).

Properties: Crystals from water + alcohol, dec 195-197° Titrates as a dibasic acid. Freely soluble in water (1 g dissolves in 3 ml H_2O). Practically insol in abs ethanol, ether. Remarkably resistant to hydrolysis by boiling with strong alkali. May be hydrolyzed by boiling with 6N HCl for 14 hrs.

Therap-Cat: Vitamin B complex; lipotropic.